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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,430	09/23/2003	Jiunn-Jyi Lay	MR957-1399	3277
4586	7590	06/30/2006	EXAMINER	
ROSENBERG, KLEIN & LEE 3458 ELLICOTT CENTER DRIVE-SUITE 101 ELLICOTT CITY, MD 21043			MARX, IRENE	
			ART UNIT	PAPER NUMBER
			1651	

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,430	LAY ET AL.	
	Examiner Irene Marx	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 09 June 2006.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 9-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 9-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____.
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____.

DETAILED ACTION

To facilitate processing of papers at the U.S. Patent and Trademark Office, it is recommended that the **CORRECT** Application Serial Number be inserted on every page of claims and/or of amendments filed.

The amendment filed 6/9/06 is acknowledged. The papers are labeled incorrectly as "10/667,530". Claims 9-12 are being considered on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 is vague and indefinite in the recitation of "0.5-1.5\0.5-1.5\10". It is unclear what is intended.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 is confusing in the recitation of "a seeding solution having a spore bacteria". To begin with, "bacteria" is plural so the phrase is grammatically incorrect. In addition, the intended meaning of "spore bacteria" does not define a proper or recognized taxonomic group. Are the "spore bacteria" responsible for hydrogen production? This is unclear from the claim as written.

In the specification as filed there is mention of "shuttle shaped spore bacteria" [0008], [0013] and [0021]. However, no further source or taxonomic identification is provided.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno *et al.* (U.S. Patent No. 5,464,539) taken with Zhang *et al.* (U.S. Patent No. 6,342,378) for the reasons as stated in the last Office action and the further reasons below.

The claims appear to be directed to a process of producing hydrogen with a spore bacteria by fermentation of waste materials such as plant material or compost in a reactor wherein the microorganisms are obtained from compost or cattle dung and wherein various nutrients such as ionic materials may be added to the waste mixture.

Ueno *et al.* teach a process of producing hydrogen and methane by fermentation using wastes as the raw material such as plant material or compost in a reactor wherein the microorganisms may be obtained from compost and wherein various nutrients such as ionic materials may be added to the waste mixture.

Ueno *et al.* disclose that nutrients including ionic materials are added to the waste mixture. See, e.g., Examples, and in particular Example 1. Even though the nutrients are not identical, the inclusion of yeast extract suggests that minerals and other micronutrients are present in suitable concentrations. In addition, the reference recognizes that methane may also be produced, depending on the microorganisms present. Col. 4, lines 20-28. That the microorganisms required for the production of hydrogen are naturally present in the compost is disclosed at col. 2, lines 13-60. Also, sludge compost is used as the inoculum in Example 4. A temperature of 40°C-70° C is indicated as appropriate for the process, which overlaps with the

instantly claimed range (col. 3, line 3). The use of nitrogen for anaerobicity is also disclosed. Col. 3, line 1. It is well recognized in the art the sludge compost is comprised of small particles, generally under 1 mm in length and width.

The reference does not clearly indicate that the compost comprises weed compost or cattle dung. However, Zhang *et al.* teaches the production of at least methane from biomass such as bagasse, grass and other agricultural waste, including manure from cattle. See, e.g., col. 1-2 and col. 6, lines 39-42. One of ordinary skill in the art would have expected the production of hydrogen at least to some extent, particularly upon adjustment of process conditions.

With regard to the presence of ionic materials, these materials are not specifically added, but are reported to be present. See, e.g., Zhang, Col. 12, lines 23-35 and Table 6. In addition, the material is mechanically processed, by a method such a grinding. Note that the apparatus has an agitating means (col. 4, line 42), thus suggesting that the process may be conducted under agitation.

The process conditions discussed in the references appear to be substantially the same as claimed. However, even if they are not, the adjustment of process conditions for optimization purposes identified as result-effective variables cited in the references would have been *prima facie* obvious to a person having ordinary skill in the art, since such adjustment is at the essence of biotechnical engineering.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process of Ueno *et al.* by using further sources of biomass and using a variety of process parameters as suggested by the teachings of Zhang *et al.* for a substantially similar process, for the expected benefit of maximizing the production of hydrogen an economically important fuel material.

Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

Response to Arguments

Applicant's arguments have been fully considered but they are not deemed to be persuasive.

Applicant appears to argue that the presence of weed compost or cattle dung renders the invention as claimed patentable over the art. However, there is nothing on the record to

demonstrate that these particular ingredients contain materials that are absent in the prior art compositions for producing hydrogen or that any unexpected results are obtained. There is nothing on the record to demonstrate that these specific components affect the production of hydrogen by any and all spore containing bacteria. In other words, a “weed compost” as recited cannot be readily distinguished from other compost of vegetable materials, whether they are or are not weeds. As a matter of fact, the definition of “weed” is ambiguous and open to interpretation. In addition, there is nothing on the record to substantiate the alleged differences in the bacteria present in sludge and weed compost or cattle dung compost. No bacterial strains have been identified. Once compost is formed, it is apparent that the microbial flora is substantially similar, particularly in the absence of evidence to the contrary. Moreover, there is no clear indication on this record that any particularly useful spore-forming bacteria are disclosed that can reproducibly be obtained by one of ordinary skill in the art as seeding material for the process. Therefore, these arguments fail to persuade that the claimed invention does not distinguish over the references.

Applicant argues the significance of fermenting the weed or cattle dung compost at 80-90°C. Yet this limitation is only in claim 10, and not in the independent claim or any other dependent claim. In addition, the arguments of unique methods steps have not been substantiated with unexpected results to demonstrate the effect of the touted method steps. The steps appear to be obvious variations of the methods of Ueno *et al.* and Zhang *et al.*, for example, well within the skill of the ordinary artisan in the fermentation arts.

The scope of the showing must be commensurate with the scope of claims to consider evidence probative of unexpected results, for example. In re Dill, 202 USPQ 805 (CCPA, 1979), In re Lindner 173 USPQ 356 (CCPA 1972), In re Hyson, 172 USPQ 399 (CCPA 1972), In re Boesch, 205 USPQ 215, (CCPA 1980), In re Grasselli, 218 USPQ 769 (Fed. Cir. 1983), In re Clemens, 206 USPQ 289 (CCPA 1980). It should be clear that the probative value of the data is not commensurate in scope with the degree of protection sought by the claim.

The rejection is deemed proper and it is adhered to.

No claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 1651

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irene Marx whose telephone number is (571) 272-0919. The examiner can normally be reached on M-F (6:30-3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Irene Marx
Irene Marx

Primary Examiner

Art Unit 1651